(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) EP 2 214 328 A3

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
12.12.2012 Bulletin 2012/50

(43) Date of publication A2:
04.08.2010 Bulletin 2010/31

(21) Application number: **10000742.6**

(22) Date of filing: **26.01.2010**

(51) Int Cl.:
H04B 7/185 *(2006.01)*

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
AL BA RS

(30) Priority: **02.02.2009 IL 19685609**

(71) Applicant: **Deutsche Telekom AG**
53113 Bonn (DE)

(72) Inventors:
- **Arnon, Shlomi**
  Lehavim 85338 (IL)
- **Kadel, Gerhard**
  64293 Darmstadt (DE)
- **Einsiedler, Hans Joachim**
  13189 Berlin (DE)

(74) Representative: **Flaccus, Rolf-Dieter**
Flaccus · Müller-Wolff
Patentanwälte
Bussardweg 10
50389 Wesseling (DE)

(54) **System providing broadband communication between terrestrial stations and airplanes**

(57) The present invention relates to a system for providing broadband communication to aircrafts, which comprises plurality of ground stations, each ground station operating in a communication protocol suitable for use in broadband ground communication, the system is characterized by comprising: (A) A ground directional antenna; (B) An airplane antenna; and (C) a ground skin interface, which comprises: (a) management module for receiving flight data from an external source, continuously directing said ground directional antenna toward an airplane based on said flight data, and further conveying flight data to ground transmitter and receiver modules; (b) a transmitter module receiving flight data from said management module, and compensating, based on said flight data, for Doppler shift in a broadband signal received from a standard ground communication unit, said transmitter transfers the compensated signal to said ground directional antenna; and (c) a receiver module receiving flight data from said management module, and compensating for Doppler shift in a broadband signal received from said ground directional antenna, said receiver transfers the compensated signal to a standard ground communication unit; and (D) an airplane skin interface, which comprises: (a) management module receiving flight data from an external source within the airplane, and conveying the flight data to an airplane transmitter and airplane receiver modules; (b) a transmitter module receiving flight data from said management module, and compensating, based on said flight data, for Doppler shift in a broadband signal received from a standard airplane communication unit, said transmitter transfers the compensated signal to said airplane directional antenna; and (c) a receiver unit receiving flight data from said management module, and compensating for Doppler shift in a broadband signal received from said airplane directional antenna, said receiver transfers the compensated signal to a standard airplane communication unit.

EP 2 214 328 A3

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 10 00 0742

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	US 2008/274734 A1 (KOSTANIC IVICA [US] ET AL) 6 November 2008 (2008-11-06) * paragraphs [0028] - [0043]; claims 1-7; figures 2-5 *	1-8	INV. H04B7/185
A	US 6 167 239 A (WRIGHT THOMAS H [US] ET AL) 26 December 2000 (2000-12-26) * claims 1-32 *	1-8	
A	US 2009/010200 A1 (LAUER BRYAN A [US] ET AL) 8 January 2009 (2009-01-08) * paragraphs [0007] - [0010]; figure 2 *	1-8	
A	US 2008/240029 A1 (LYNCH MICHAEL J [US] ET AL) 2 October 2008 (2008-10-02) * paragraphs [0007] - [0013], [0078], [0079], [0083]; figures 1-10 *	1-8	

TECHNICAL FIELDS SEARCHED (IPC)
H04B

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
The Hague	2 November 2012	Bischof, Jean-Louis

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons
.....
& : member of the same patent family, corresponding document

1 EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 10 00 0742

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

02-11-2012

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2008274734 A1	06-11-2008	CA 2727609 A1	17-12-2009
		CN 102217409 A	12-10-2011
		EP 2292071 A1	09-03-2011
		US 2008274734 A1	06-11-2008
		WO 2009151735 A1	17-12-2009
US 6167239 A	26-12-2000	NONE	
US 2009010200 A1	08-01-2009	AU 2009255574 A1	10-12-2009
		CA 2720246 A1	10-12-2009
		CN 102037661 A	27-04-2011
		EP 2269325 A2	05-01-2011
		RU 2010144494 A	10-05-2012
		US 2009010200 A1	08-01-2009
		US 2011320576 A1	29-12-2011
		WO 2009148658 A2	10-12-2009
US 2008240029 A1	02-10-2008	US 2008240029 A1	02-10-2008
		US 2008240038 A1	02-10-2008
		US 2008240061 A1	02-10-2008
		US 2008240062 A1	02-10-2008
		US 2012236784 A1	20-09-2012
		US 2012236785 A1	20-09-2012
		US 2012238204 A1	20-09-2012
		US 2012240170 A1	20-09-2012

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82